YART ¡ Yet Another Route Tool !©

Follow an up-to-date flight plan with MFS ATC

Choosing an aircraft and an equipment

Choosing an aircraft and an equipment is important to the user who is going to use the Ivap Flight plan or the validation at Eurocontrol. Choosing the equipment allows ConvertRfinder to format the *performance of navigation* as required in the 2012 ICAO flight plan. It is achieved in the advanced interface shown below.

The correspondence between the equipment and the performance of navigation is given in the table below, per ICAO rules.

Navigation specification		Sensor certified fo use with the nav spec (Sensor)					
		All sensors	GNSS	DME/DME	DME/DME/IRU (VOR/DME for B4)	INS/IRS	LORAN
		1	2	3	4	5	6
RNAV 10	A	A1					
RNAV 5	B	B1	B2	B3	B4	B5	B6
RNAV 2	C	C1	C2	C3	C4		
RNAV 1	D	D1	D2	D3	D4		
RNP 4	L	L1					
RNP 1	O	O1	O2	O3	O4		
RNP APCH	S	S1 or S2 (with Baro)					
RNP AR APCH	T	T1 or T2 (with RF)					

A collection of preset equipments

YART ¡ Yet Another Route Tool !© offers a collection of preset equipments to match the table above and fill an ICAO 2012 flight plan with both fields 10 and 18 set as required. So you don't really have to care about the ICAO codification depicted above if you don't want to. See the table below.

Preset YART equipment	Equipment[1] - Field 10	According preset performance - Field 18
ADF DME ILS VOR	SDFY/S	
ADF DME ILS VOR GPS.BRNAV	SDFHGRZY/S	PBN/A1B2B3B4 RMK/NONRVSM
ADF DME ILS VOR GNSS.BRNAV + EURPRNAV	SDFHGRWYZ/S	PBN/A1B2B3B4C3D3 NAV/EURPRNAV
ADF DME ILS VOR GNSS.PRNAV	SDFHGRWYZ/S	PBN/A1B1C1D1D2D3
ADF DME ILS INS VOR	SDFHIRWY/S	PBN/A1B3B4B5C4D4
ADF DME ILS INS VOR GNSS	SDFHIRGWY/EB2	PBN/A1B1C1D1
With Required Navigation Performance Certification (either SBAS or BaroVNAV) :		
ADF DME ILS VOR GPS + RNP SBAS	SDFRGBY/EV2	PBN/A1B2B3B4S1 NAV/EURPRNAV GPS SBAS
ADF DME ILS INS VOR GNSS + RNP SBAS	SDFHIRGBWY/EB2	PBN/A1B1C1D1L1O1S1 NAV/APV SBAS LPV
ADF DME ILS INS VOR GNSS + RNP Baro[2]	SDFHIRGWY/EB2	PBN/A1B1C1D1L1O1S2
With RNP and "Authorization required" capacity :		
ADF DME ILS INS VOR GNSS + RNP [AR] Baro	SDFHIRGWY/LB2	PBN/A1B1C1D1L1O1S2T1 NAV/RNP WITH RF
With Ground Based Augmentation System for GLS[3] :		
ADF DME ILS INS VOR GNSS + RNP GBAS	SDFHIRAGWY/LB2	PBN/A1B1C1D1L1O1S1 NAV/GBAS
With both GBAS and AR :		
ADF DME ILS INS VOR GNSS + RNP [AR] GBAS	SDFHIRAGWY/LB2D1	PBN/A1B1C1D1L1O1S1T1 NAV/GBAS RNP AR WITH RF

Equipment preferentially attributed to a general aviation aircraft when equipped with SBAS

1 The equipments are annotated in the ICAO format as described later in this document.
2 RNP capacity based on the barometric altimeter embedded in the airplane for vertical guidance
3 Ground-based landing system - GLS.

Of course you can still edit by hand the performance of navigation in the YART interface or in the downloaded IVAO flight plan.

Typical relation between equipment and aircraft

If you don't know what kind of equipment fits best your aircraft, you might look at the next table. The three bolded rows are for ADF DME ILS VOR GPS, but with slightly different flavors of the GPS.

Equipment	Typical aircraft *Typical simulations*
ADF DME ILS VOR	General aviation, early airliners without INS *CaptainSim B727 FS9 as delivered*
ADF DME ILS VOR GPS.BRNAV	Retrofitted 1980's airliners with a GPS added in the cockpit like some Bae-146 or some B727 or a C172 with a GPS *QW Bae-146 with GNS-XLS, Carenado C208B with default GPS.*
ADF DME ILS VOR GNSS.BRNAV + EURPRNAV	Retrofitted 1980's airliners certified up to RNAV 1 (per GPS or DME/DME) and equiped with a GPS *QW Bae-146 with GNS-XLS. Carenado Beech 1900D.*
ADF DME ILS VOR GNSS.PRNAV	
ADF DME ILS INS VOR	1980's airliners with IRS : some B727 or Concorde or B757
ADF DME ILS INS VOR GNSS[4] *(intended for P-RNAV)*	1990's airliners : all B737, A320, ATR, EMB, RJ... *The vast majority of simulated airliners* *PSS757, QW Avro RJ, Wilco/Feelthere Airbus, Airbus X Extended*
ADF DME ILS INS VOR GNSS RNP[5]	A subset of B737 or A320 in the 2000's *feelthere E-jets v2*
+ RNP AR[6]	Another subset of the above aircraft in the 2010's *PMDG NGX©, PMDG 777, iFly 737*
+ GNSS capacity with SBAS[7]	Modern general aviation aircraft *The Garmin® GPS frontend gauge for MFS by RealityXP*
	Some retrofitted airliners
+ GNSS capacity with GBAS[8]	Airliners from 2014 and onwards

List of equipments in the ICAO Flight Plan format

A GBAS landing system
B LPV (APV with SBAS)

4 GNSS means the capacity to update the aircraft position using the Global Navigation Satellite System
5 Required Navigation Performance
6 RNP certification with capacity to follow tracks labeled by States with the terms "Authorization required" (AR) (formerly known as SAAAR : *Special Aircraft* and Aircrew *Authorization Required*), *e.g.* capacity to follow Radius-to-fix legs and fly with a greater accuracy, with a special crew trained for this purpose.
7 Satellite-based Augmentation System (WAAS, EGNOS)
8 Ground-based Augmentation System (Ground-based landing system -GLS- dedicated to replace the ILS)

C LORAN C
K MLS
L ILS
O VOR
D DME
F ADF
G GNSS - Whenever G is filled, the eventual satellite augmentation system is filled in the field N°18 under NAV/.
H HF RTF
R PBN approved - Whenever an aircraft is RNAV capable, the field n°10 will be completed with the letter R and in the field n°18 the PBN (performance-based navigation) must be filled in accordance with each aircraft capacities and crew certifications.
I Inertial Navigation
T TACAN
U UHF RTF
V VHF RTF
W RVSM approved
X MNPS approved
Y VHF with 8,33 kHz spacing between channels
S = V + O + L
/
S Squawk – S mode, with transmission of barometric altitude and aircraft identification
E Squawk – S mode, with transmission of barometric altitude, aircraft identification and long squitters (ADS-B)
L Squawk – S mode, with transmission of barometric altitude, aircraft identification and long squitters (ADS-B) plus enhanced surveillance capacity
B1 ADS-B with specialized ADS-B 1 090 MHz emission
B2 ADS-B with specialized ADS-B 1 090 MHz emission and reception
V2 ADS-B emission and reception using VDL mode 4 *(less expansive for GA)*
D1 ADS-C

EURPRNAV is inserted to indicate that the aircraft is P-RNAV approved with a positioning only calculated by VOR/DME means.